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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,282	03/25/2005	Keiichiro Aoki	123318	2001

25944 7590 08/21/2006

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EXAMINER
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KHUU, HIEN DIEU THI

ART UNIT	PAPER NUMBER
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2863

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



## **DETAILED ACTION**

### ***Specification Objection***

The specification is objected to because it discloses a D/A converter (36) coming out of the sensor current detection circuitry before entering the microcomputer (34). The specification should state of an A/D converter in place of a D/A converter. Correction is required.

### ***Drawings Objection***

Figure 2 is objected to because reference characters "36" define a D/A converter. Examiner considers data coming out of sensor current detection circuit requires an A/D converter before entering the microcomputer (34). Correction is required.

The replacement sheet of Figure 2 filed 08/08/2006 is objected to because it no longer consists of Fig. 1 and Fig. 2 as originally filed 03/25/2005.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al. (US 6,304,813).

With respect to claims 1 and 11, Ikeda discloses an exhaust gas sensor control device (100) for an exhaust gas sensor that is mounted in an exhaust path of an internal combustion engine (Fig. 9), wherein said exhaust gas sensor (1) includes a sensor element (2) that becomes active when an activity temperature is reached (Column 5, lines 7-10), the exhaust gas sensor control device (100) comprising:

an impedance detection device for detecting an element impedance of said sensor element (Column 7, lines 44-53);

an impedance judgment device for judging whether said element impedance is lowered to an activity judgment value (Fig. 7; Column 7, lines 44-53);

a received heat amount estimation device for estimating the amount of heat received by said sensor element (Claim 1, lines 7-8);

a heat amount judgment device for judging whether an activity judgment heat amount is reached by said amount of heat received (Fig. 7; Column 8, lines 10-13); and

an activity judgment device for formulating an activity judgment of said exhaust gas sensor when an affirmative judgment is executed either by said impedance judgment device or by said heat amount judgment device (Column 4, lines 50-58).

#### ***Allowable Subject Matter***

Claims 2-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious, which makes the following claims allowable over the prior art:

With respect to claim 2, the exhaust gas sensor control device wherein said exhaust gas sensor includes a heater for heating the sensor element; said exhaust gas sensor control device further comprising a heater drive device for driving said heater in an environment where the activation of said exhaust gas sensor is demanded; wherein said heat amount judgment device determines whether an activity judgment

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heat amount is reached by the amount of heat received by said sensor element based on the result of whether an activity judgment time is reached by a period of time during which the heater is powered after the activation of said exhaust gas sensor is demanded.

With respect to claim 3, the exhaust gas sensor control device wherein said exhaust gas sensor includes a heater for heating the sensor element; said exhaust gas sensor control device further comprises a heater drive device for driving said heater in an environment where the activity of said exhaust gas sensor is demanded; wherein said heat amount judgment device determines whether an activity judgment heat amount is reached by the amount of heat received by said sensor element based on the result of whether an activity judgment power supply amount cumulative value is reached by the cumulative amount of power that has been supplied to the heater after the activity of said exhaust gas sensor is demanded.

With respect to claim 4, the exhaust gas sensor control device wherein said heat amount judgment device determines whether an activity judgment heat amount is reached by the amount of heat received by said sensor element based on the result of whether an activity judgment air amount is reached by the cumulative amount of air that has been taken in after internal combustion engine startup.

With respect to claim 5, the exhaust gas sensor control device wherein said heat amount judgment device determines whether an activity judgment heat amount is reached by the amount of heat received by said sensor element based on the result of whether an activity judgment fuel amount is reached by the cumulative amount of fuel that has been supplied to an internal combustion engine after internal combustion engine startup.

With respect to claim 6, the exhaust gas sensor control device further comprising: a startup water temperature detection device for detecting a startup cooling water temperature of an internal combustion engine, wherein said heat amount judgment device includes an activity judgment heat amount setup device for increasing said activity judgment heat amount with a decrease in said startup cooling water temperature.

With respect to claim 7, the exhaust gas sensor control device wherein said exhaust gas sensor includes a heater for heating the sensor element, said exhaust gas sensor control device further comprising a heater drive device for driving said heater in an environment where the activity of said exhaust gas sensor is demanded; and a battery voltage detection device for detecting a battery voltage; wherein said received heat amount estimation device includes a warm-up period correlation value calculation device for detecting a warm-up period correlation value that correlates with a warm-up period for said sensor element; and wherein said heat amount judgment device includes a device for judging, when a sensor activity judgment correlation value is reached by said warm-up period correlation value, that said activity judgment heat amount is reached by said amount of heat received, and a judgment value setup device for increasing said sensor activity judgment correlation value with a decrease in a battery voltage prevailing during a warm-up process for said sensor element.

With respect to claim 8, the exhaust gas sensor control device wherein said exhaust gas sensor includes a heater for heating said sensor element, said exhaust gas sensor control device further comprising; a heater drive device for driving said heater in an environment where the activity of said exhaust gas sensor is demanded, said heater drive device including a feedback control device for exercising feedback control over said heater so that said element impedance coincides with target impedance; a deterioration judgment device for judging the deterioration of the sensor element when said element impedance is judged to be excessive for the amount of heat received by said sensor element; and a target impedance correction device for increasing the target impedance for correction purposes when said sensor element is judged to have deteriorated.

With respect to claim 9, the exhaust gas sensor control device wherein said exhaust gas sensor includes a heater for heating said sensor element, said exhaust gas sensor control device further comprising; a heater drive device for driving said heater in an environment where the activity of said exhaust gas sensor is demanded, said heater drive device including a feedback control device for exercising feedback control over said heater so that said element impedance coincides with target impedance; a deterioration judgment device for judging the deterioration of the sensor element when said element impedance is judged to be excessive for the amount of heat received by said sensor element; and

an activity judgment value correction device for increasing said activity judgment value for correction purposes when said sensor element is judged to have deteriorated.

With respect to claim 10, the exhaust gas sensor control device wherein the condition to be judged by said impedance judgment device and the condition to be judged by said received heat amount estimation device are predefined so that the former condition is satisfied prior to the latter condition when said sensor element exhibits an initial impedance; and wherein said deterioration judgment device judges that said element impedance is excessive for said amount of heat received when the latter condition is satisfied prior to the former condition.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance.

#### ***Response to Arguments***

Applicant's arguments filed 08/08/2006, with respect to the rejection(s) under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ikeda et al. (US 6,304,813). See rejections above.

#### ***Fax/Telephone Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy D. Khuu whose telephone number is (571) 272-8585. The examiner can normally be reached on M-F, 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CHL 8/17/06

  
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